PROPOSED TOITDALE SOLAR ENERGY FACILITY

ON A SITE NEAR NOUPOORT IN THE NORTHERN CAPE

VISUAL IMPACT ASSESSMENT

AS PART OF A BASIC ASSESSMENT PROCESS

Produced for:

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1. STUDY APPROACH

1.1. Qualification and Experience of the Practitioner

MetroGIS (Pty) Ltd, specialising in visual assessment and Geographic Information Systems, undertook this visual assessment in collaboration with V&L Landscape Architects CC.

Lourens du Plessis, the lead practitioner undertaking the assessment, has been involved in the application of Geographical Information Systems (GIS) in Environmental Planning and Management since 1990.

The team undertaking the visual assessment has extensive practical knowledge in spatial analysis, environmental modelling and digital mapping, and applies this knowledge in various scientific fields and disciplines. The expertise of these practitioners is often utilised in Environmental Impact Assessments, State of the Environment Reports and Environmental Management Plans.

The visual assessment team is familiar with the "Guidelines for Involving Visual and Aesthetic Specialists in EIA Processes" (Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning) and utilises the principles and recommendations stated therein to successfully undertake visual impact assessments. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, the core elements are more widely applicable.

Savannah Environmental (Pty) Ltd appointed MetroGIS (Pty) Ltd as an independent specialist consultant to undertake the visual impact assessment for the proposed Toitdale Concentrated Photovoltaic (CPV) Facility in the Northern Cape Province. Neither the author, MetroGIS or V&L Landscape Architects will benefit from the outcome of the project decision-making.

1.2. Assumptions and Limitations

This assessment was undertaken during the planning stage of the project and is based on information available at that time.

1.3. Level of Confidence

Level of confidence[1] is determined as a function of:

- The information available, and understanding of the study area by the practitioner:
  - 3: A high level of information is available of the study area and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.
  - 2: A moderate level of information is available of the study area and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.
  - 1: Limited information is available of the study area and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.

- The information available, understanding of the study area and experience of this type of project by the practitioner:

[1] Adapted from Oberholzer (2005).

- 3: A high level of information and knowledge is available of the project and the visual impact assessor is well experienced in this type of project and level of assessment.
- 2: A moderate level of information and knowledge is available of the project and/or the visual impact assessor is moderately experienced in this type of project and level of assessment.
- 1: Limited information and knowledge is available of the project and/or the visual impact assessor has a low experience level in this type of project and level of assessment.

These values are applied as follows:

Table 1: Level of Confidence

	Information on the project & experience of the practitioner			
Information on the study area		**3**	**2**	**1**
	3	9	6	3
	2	6	4	2
	1	3	2	1

*The level of confidence for this assessment is determined to be **6** and indicates that the author's confidence in the accuracy of the findings is high:*

- The information available, and understanding of the study area by the practitioner is rated as **2** and
- The information available, understanding of the project and experience of this type of project by the practitioner is rated as **3**.

1.4. Methodology

The study was undertaken using Geographic Information Systems (GIS) software as a tool to generate viewshed analyses and to apply relevant spatial criteria to the proposed facility. A detailed Digital Terrain Model (DTM) for the study area was created from 20m interval contours supplied by the Surveyor General.

The approach utilised to identify issues related to the visual impact included the following activities:

- The creation of a detailed digital terrain model (DTM) of the potentially affected environment;
- The sourcing of relevant spatial data. This included cadastral features, vegetation types, land use activities, topographical features, site placement, etc;
- The identification of sensitive environments upon which the proposed facility could have a potential impact;
- The creation of viewshed analyses from the proposed development area in order to determine the visual exposure and the topography's potential to absorb the potential visual impact. The viewshed analysis takes into account the dimensions of the proposed structures.

This report (visual impact assessment) sets out to identify and quantify the possible visual impacts related to the proposed CPV Facility, including associated infrastructure, as well as offer potential mitigation measures, where required.

The following methodology has been followed for the assessment of visual impact:

- **Determine Potential visual exposure**

  The visibility or visual exposure of any structure or activity is the point of departure for the visual impact assessment. It stands to reason that if the proposed CPV Facility and associated infrastructure were not visible, no impact would occur.

  Viewshed analyses of the proposed CPV Facility and related infrastructure on the site indicate the potential visibility.

- **Determine the Visual Absorption Capacity of the Landscape**

  This is the capacity of the receiving environment to absorb the potential visual impact of the proposed facility. The VAC is primarily a function of the vegetation, and will be high if the vegetation is tall, dense and continuous. Conversely, low growing sparse and patchy vegetation will have a low VAC.

  The VAC would also be high where the environment can readily absorb the structure in terms of texture, colour, form and light / shade characteristics of the structure. On the other hand, the VAC for a structure contrasting markedly with one or more of the characteristics of the environment would be low.

  The VAC also generally increases with distance, where discernable detail in visual characteristics of both environment and structure decreases.

  The digital terrain model utilised in the calculation of the visual exposure of the facility does not incorporate the potential visual absorption capacity (VAC) of the natural vegetation of the region. It is therefore necessary to determine the VAC by means of the interpretation of the vegetation cover, supplemented with field observations.

- **Determine Visual Distance and Observer Proximity to the facility**

  In order to refine the visual exposure of the proposed facility on surrounding areas/receptors, the principle of reduced impact over distance is applied in order to determine the core area of visual influence for the CPV Facility.

  Proximity radii for the proposed development site are created in order to indicate the scale and viewing distance of the facility and to determine the prominence of the structures in relation to their environment.

  The visual distance theory and the observer's proximity to the facility are closely related, and especially relevant, when considered from areas with a high viewer incidence and a predominantly negative visual perception of the proposed facility.

- **Determine Viewer Incidence and Viewer Perception**

  The number of observers and their perception of a structure determine the concept of visual impact. If there are no observers, then there would be no visual impact. If the visual perception of the structure is favourable to all the observers, then the visual impact would be positive.

It is therefore necessary to identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed CPV Facility and its related infrastructure.

It would be impossible not to generalise the viewer incidence and sensitivity to some degree, as there are many variables when trying to determine the perception of the observer; regularity of sighting, cultural background, state of mind, and purpose of sighting which would create a myriad of options.

- **Determine the Visual impact index**

  The results of the above analyses are merged in order to determine where the areas of likely visual impact would occur. These areas are further analysed in terms of the previously mentioned issues (related to the visual impact) and in order to judge the magnitude of each impact.

- **Determine Impact significance**

  The potential visual impacts identified and described are quantified in their respective geographical locations in order to determine the significance of the anticipated impact. Significance is determined as a function of extent, duration, magnitude and probability.

2. BACKGROUND

Toitdale Solar Energy (Pty) Ltd is proposing the establishment of a Concentrated Photovoltaic (CPV) Solar Energy Facility on a site north west of Noupoort within the Umsobomvu Local Municipality in the Northern Cape Province.

Concentrated Photovoltaic (CPV) technology will be used as part of the alternative energy generation facility with a total generating capacity of 10MW.

The purpose of the proposed facility is to add new capacity for generation of renewable energy to the national electricity mix.

The proposed CPV Facility will consist of the following infrastructure:

- Concentrating Photovoltaic (CPV) panels with a generation capacity of 10 MW.
- Dedicated transformers to convert the electricity from direct to alternating current as well as on-site switchgear.
- Underground cabling between the CPV panels, the transformers, the switch gear and Eskom’s existing Newgate Substation.
- Internal access roads may be required
- Laydown areas and a workshop may be required.

3. SCOPE OF WORK

The broader study area (i.e. the extent of the maps shown in this report) encompasses an area of approximately 400 km².

The project is proposed on **Portion 1 of the Farm Toitdale 167**. The footprint for the proposed CPV facility (i.e. the extent of the proposed plot on site) will cover approximately 0,2 km².

The scope of work for this assessment includes the determination of the potential visual impacts in terms of nature, extent, duration, magnitude, probability and significance of the construction and operation of the proposed infrastructure.

Anticipated issues related to the proposed CPV facility include:

- The visibility of the facility to, and potential visual impact on, observers travelling along main roads (i.e. the N9 and R389) and secondary roads in close proximity[2] to the proposed CPV facility and within the region[3].
- The visibility of the facility to, and potential visual impact on residents of homesteads and farm settlements within the region.
- The visibility of the facility to, and potential visual impact on built up areas (i.e. Noupoort and Kwa-Zamuxolo) within the region.
- The visibility of the facility to, and potential visual impact on commuters travelling by rail in close proximity to the proposed CPV facility and within the region.
- The potential impact of the facility on the visual character of the landscape and the sense of place of the region, especially in terms of scenic and sensitive topographical features such as the mountains.
- The potential visual impact of the facility on tourist access routes within the region.
- The potential visual impact of the construction of ancillary infrastructure (i.e. the internal access roads, fences, offices, workshops and storage areas) on observers in close proximity to the proposed CPV facility.
- The potential visual impact of operational, safety and security lighting of the facility at night on observers in close proximity to the proposed CPV facility.
- Potential visual impacts associated with the construction phase on observers in close proximity to the proposed CPV facility.
- Potential cumulative visual impacts of the proposed CPV facility.
- Potential residual visual impacts after the decommissioning of the facility.
- The potential to mitigate visual impacts and inform the design process.

[2] For the purpose of this study, close proximity is considered to be within 2km of the proposed CPV facility.

[3] For the purpose of this study, the region is considered to be beyond the 2km radius of the proposed CPV facility.

4. THE AFFECTED ENVIRONMENT

Regionally, the study area is located some 50 km south east of Colesberg and approximately 30 km north of Middelburg, within the Northern Cape Province.

The study area (i.e. the extent of the maps) occurs on land that ranges in elevation from 1400m above sea level (asl) in the north west to about 1800m asl at the top of the local hills in the east and south of the study area.

A number of non-perennial rivers traverse the study area, generally flowing in a north westerly direction. A number of dams are located along these rivers, especially in the vicinity of homesteads and farming settlements.

The terrain surrounding the proposed facility is generally flat to undulating. A prominent mountain range runs north to south through the eastern part of the study area. Smaller hills are located to the north, north west and west.

The terrain type of the region is described as *low mountains* in the south west giving rise to *lowlands with hills* in the north west. The site Toitdale Solar Energy is situated on relatively flat land. Refer to **Map 1**.

The climate is semi arid, and the study area receives between 248mm and 433mm of rainfall per annum. Land cover is primarily *shrubland,* interspersed with patches of *grassland.* Small patches of *Thicket and Bushland* occur, especially in the vicinity of dams and agricultural settlements and some *degraded land* is also evident.

The vegetation type is *Karroid danthonia mountain veld* and *False upper karoo.* Refer to **Map 2**.

The built up areas of Noupoort and Kwa-Zamuxolo account for the highest population concentration within a region, which has an average of 3,5 people[4] per km^2.

The N9 bypasses the site some 5km to the east, and represents a well known tourist route giving access to both the Western Cape and the Eastern Cape. The R389 some 2,5km south of the site is an arterial road connecting with the N1 to the north west of the study area.

Two railway lines traverse the study area. One line roughly follows the alignment of the N9 in a north south direction, while the second extends to the north west, bypassing the site and Noupoort Substation in close proximity. Both line pass through Noupoort, and are assumed to carry both passengers and freight.

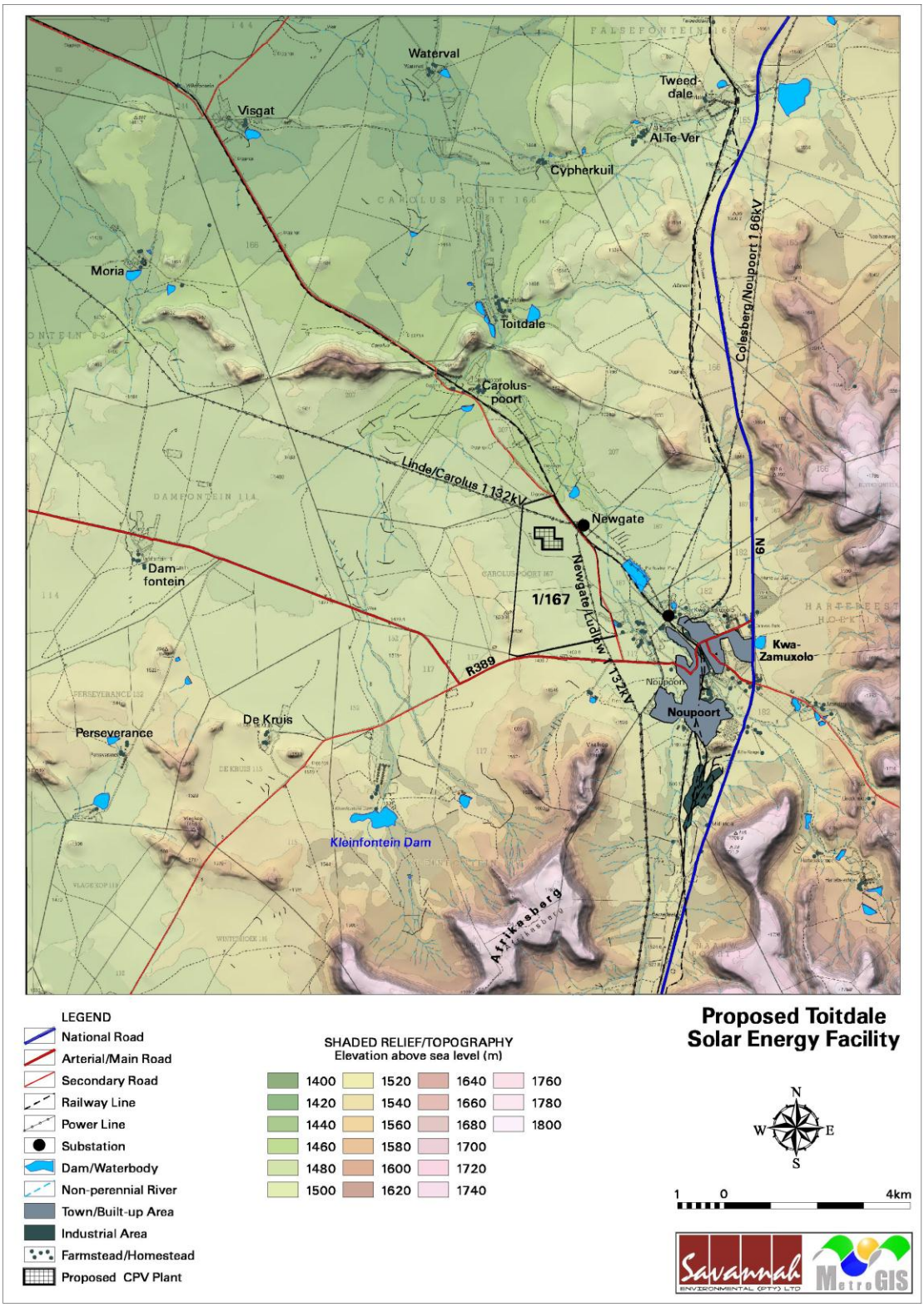
A small industrial area is located south of Noupoort. Other than this, industrial type infrastructure is limited to a number of power lines. These include the Colesberg / Noupoort 66kV line running in a north south direction as well as the Linde / Caroulus 132kV line extending to the north west. The Newgate Substation is located less than a kilometre to the east of the proposed site.

The region has an undeveloped, natural character, with wide open spaces against a backdrop of low mountains. Agricultural land uses (primarily grazing) are dotted throughout. Overall, the visual quality of the study area is considered to be high, especially outside of the urban and built up areas.

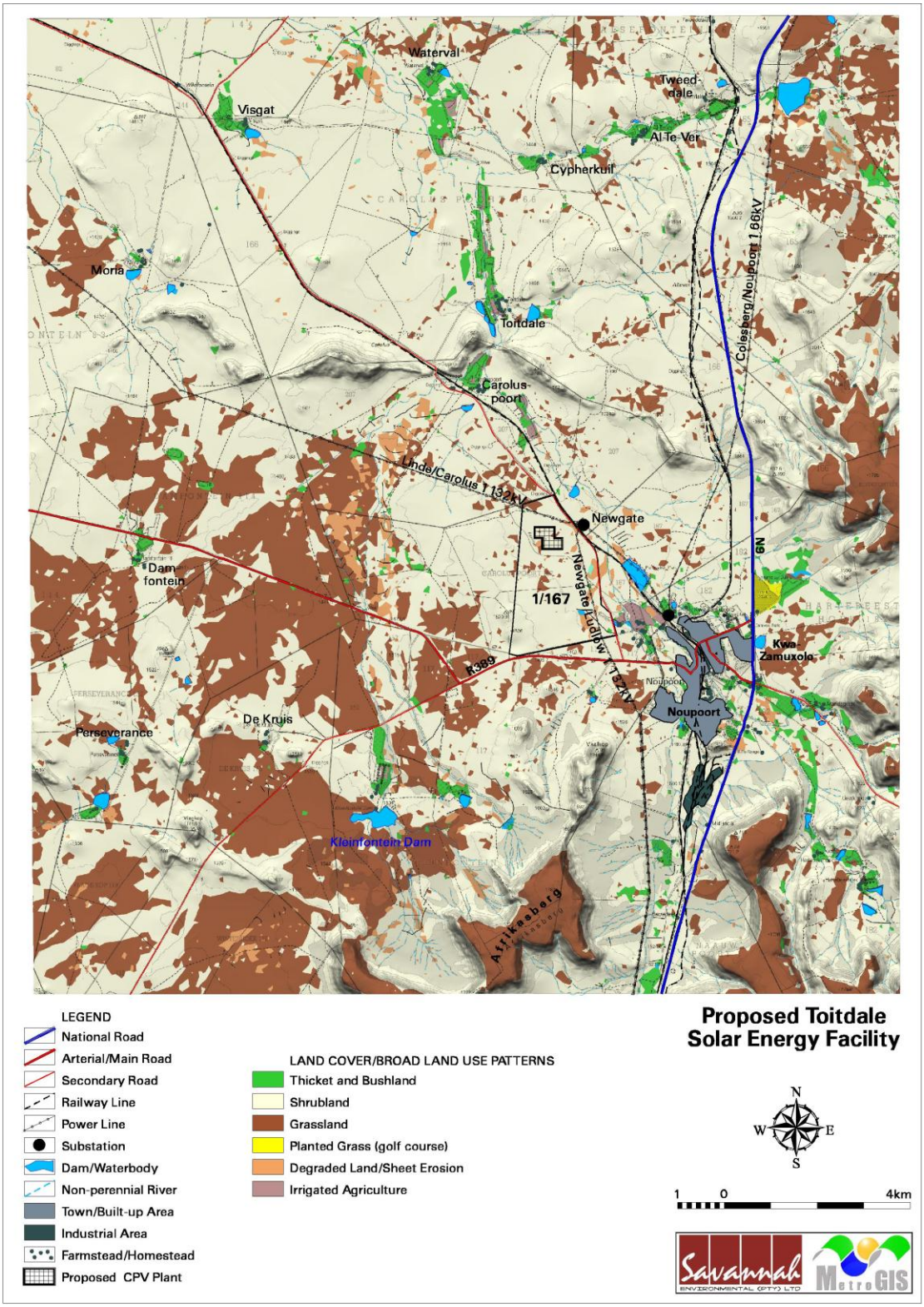
[4] http://en.wikipedia.org/wiki/Umsobomvu_Local_Municipality

Figure 1: Visual quality of the vegetation surrounding the proposed CPV facility.

Figure 2: Visual quality of the topography of the study area.
Note the flat terrain in the foreground with the low mountains beyond.



Map 1: Locality, topography and shaded relief of the broader study area.



Map 2: Land cover and broad land use patterns within the broader study area.

5. RESULTS

5.1. Potential visual exposure

The result of the visibility analysis for the proposed CPV Facility is shown on **Map 3**. The analysis was undertaken from a number of vantage points within the proposed CPV footprint at an offset of 15m above average ground level (i.e. the approximate maximum height of the CPV structures).

This was done in order to determine the visual exposure of the proposed CPV facility within the study area, by simulating the proposed structures associated with the CPV Facility.

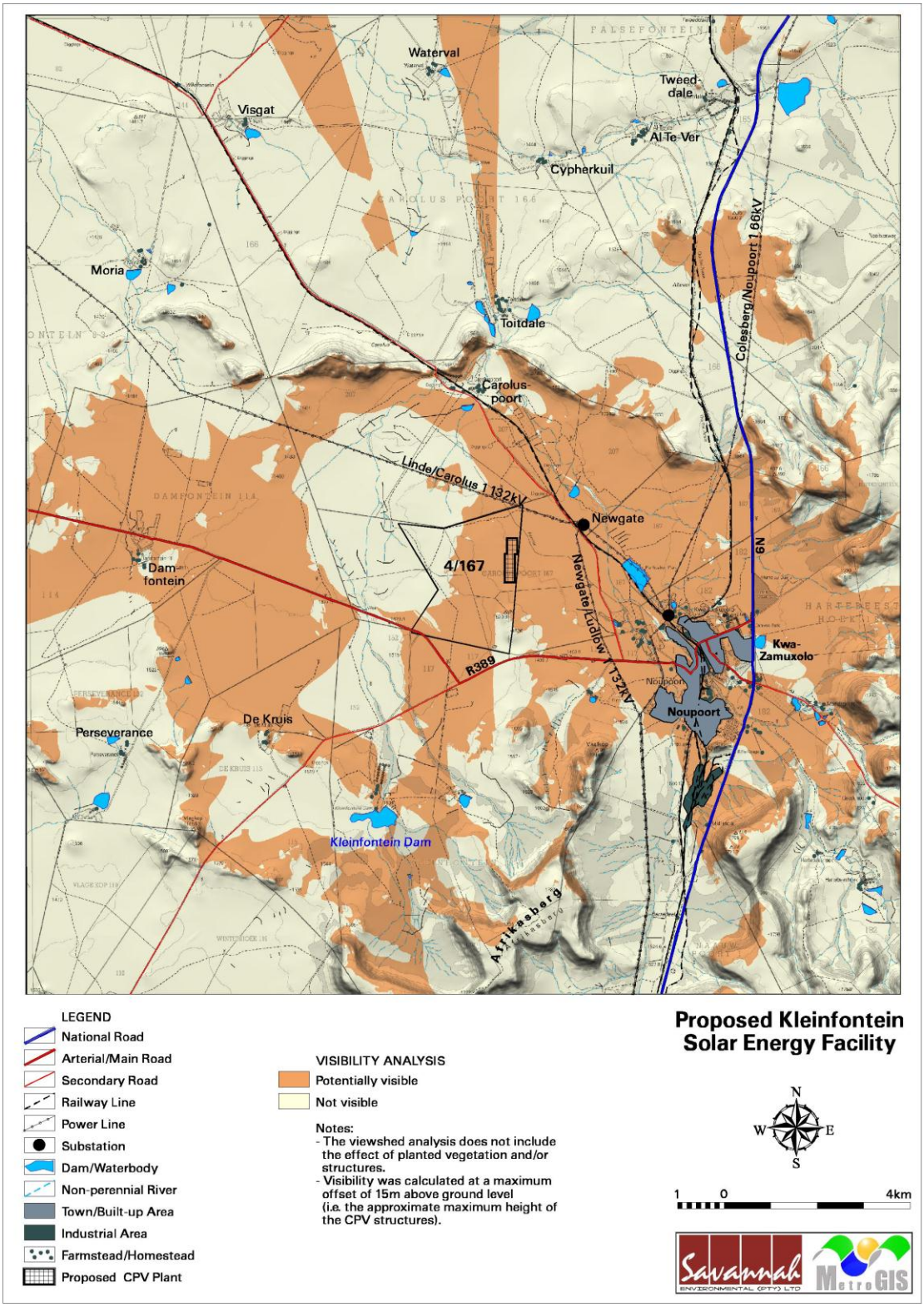
It must be noted that the viewshed analyses do not include the potential shielding effect of vegetation cover or existing structures on the exposure of the proposed facility, and it does not take into consideration the limitations of the human eye, therefore signifying a worst-case scenario.

The analysis indicates that the proposed CPV Facility is likely to be visually exposed within the site Toitdale Solar Energy and the area within about 2km to the east , 4km to the north and south.

The topography which rises gently to the west limits visibility in the west of the study area. In addition, the low hills to the north, and the mountains to the east and south act as visual barriers, effectively shielding the areas beyond. The faces of the mountains orientated towards the site will be visually exposed, however.

The towns of Noupoort and Kwa-Zamuxolo as well as the N9 and R389 fall within the zone of potential visual exposure.

It is envisaged that the proposed facility would be visible to observers travelling along roads and railway lines, residents of Noupoort and Kwa-Zamuxolo and of homesteads and farms as well as tourists visiting the region, within (but not restricted to) a 4km radius of the facility.



Map 3: Potential Visual Exposure of the Preferred Site for the Proposed CPV facility.

5.2. Visual absorption capacity

The climate is semi arid, with the study area receiving between 248mm and 433mm of rainfall per annum. Land cover is primarily *shrubland,* interspersed with patches of *grassland.* Small patches of *Thicket and Bushland* occur, especially in the vicinity of dams and agricultural settlements and some *degraded land* is also evident.

Overall, the Visual Absorption Capacity (VAC) of the receiving environment is low due to the nature and height of the vegetation and the largely undeveloped state of the receiving environment. VAC will thus not be taken into account in the undeveloped environment.

Within the built up areas of Noupoort and Kwa-Zamuxolo, VAC will be of some relevance, due to the presence of buildings, structures and visual clutter. In this respect, the presence of the urban environment will 'absorb' the visual impact to some extent. For this reason, neither **Map 4** nor **Map 5** indicate the urban areas as sensitive visual receptors, as the VAC of the buildings and infrastructure will render visual impact to be much reduced from within these areas.

5.3. Visual distance / observer proximity to the facility

MetroGIS / V&L determined proximity radii based on the anticipated visual experience of the observer over varying distances. The following factors are considered for the determination of appropriate proximity radii:

- The normal cone of vision for a stationary person, which is accepted to be 30 degrees in both the vertical and the horizontal fields. This cone of vision allows for no head or eye movement and no loss of focus of the object in question.
- The maximum horizontal extent or widest cross section of the proposed facility that an observer will be able to perceive.
- The maximum height of the tallest infrastructure.

For a CPV facility, the horizontal extent is of most significance. Despite being made up of smaller components (i.e. the individual CPV panels), a CPV facility will manifest as a single visual entity. It follows that the larger the facility, the larger will be the anticipated visual impact at any given distance, and the more visible the facility will be over larger distances.

In this respect, the proximity radii are calculated as a function of the critical point at which an observer will be able to perceive the full extent of the facility within a normal 30 degree cone of vision.

MetroGIS / V&L developed this methodology in the absence of any known and/or acceptable standards for South African solar energy facilities.

The proximity radii used for this study (calculated from the boundary lines of the farms) are shown on **Map 4** and are as follows:

- 0 – 2 km - Short distance view where the facility would dominate the frame of vision and constitute a very high visual prominence.
- 2 – 4 km - Medium distance views where the facility would be easily and comfortably visible and constitute a high visual prominence.
- 4 – 8 km - Medium to longer distance view where the facility would become part of the visual environment, but would still be visible and recognisable. This zone constitutes a medium visual prominence.

- Greater than 8 km - Long distance view where the facility would still be visible though not as easily recognisable. This zone constitutes a low visual prominence for the facility.

5.4. Viewer incidence / viewer perception

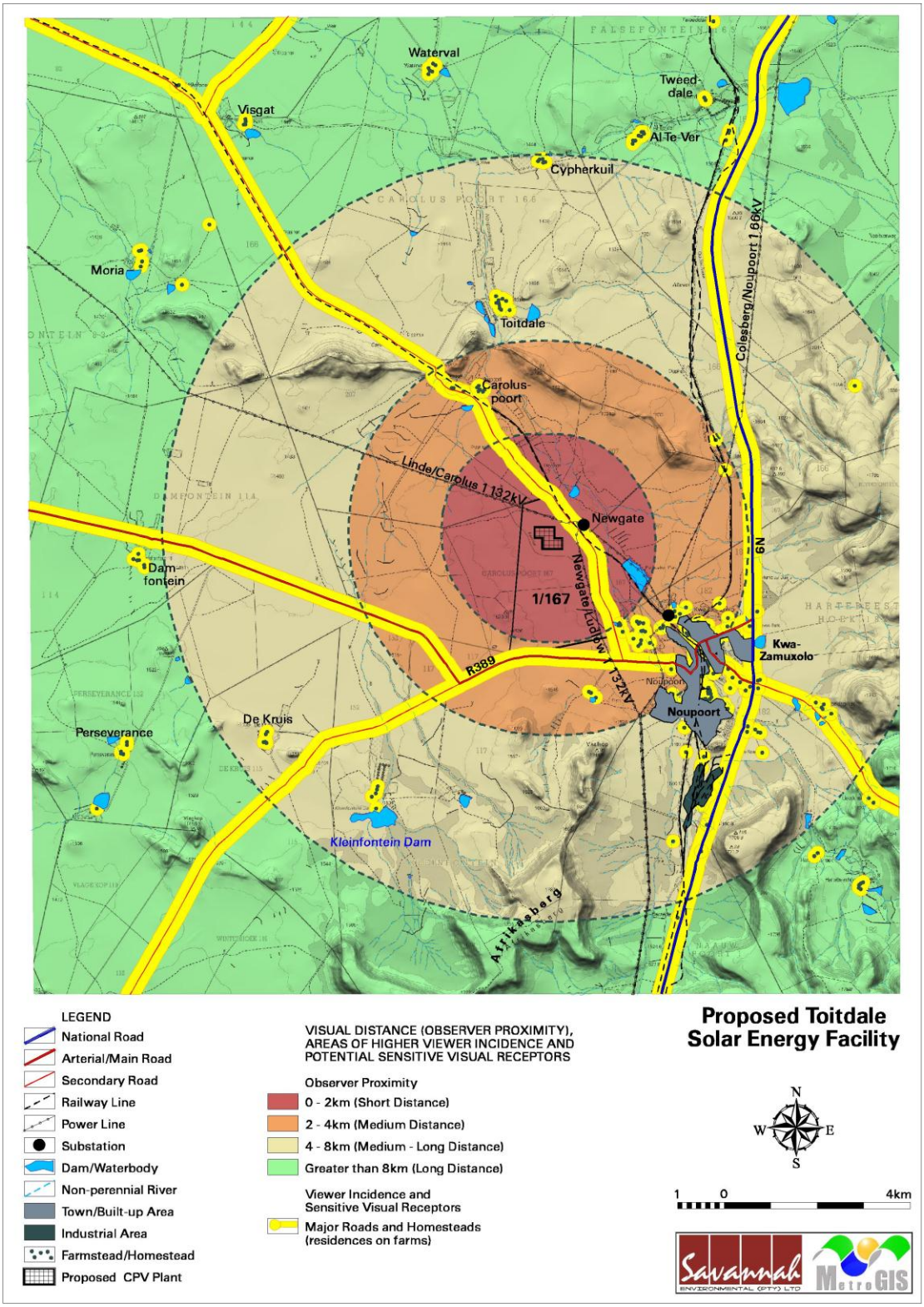
Refer to **Map 4**. Viewer incidence is calculated to be the highest along the national road (i.e. the N9) and arterial roads (i.e. the R389) as well as along the secondary roads within the study area. Commuters using these roads could be negatively impacted upon by visual exposure to the facility.

Other than along the above roads, viewer incidence will be concentrated in the towns of Noupoort and Kwa-Zamuxolo and within the agricultural homesteads and settlements within the study area.

Tourists visiting and travelling through the area are also seen as possible sensitive visual receptors upon which the presence of the proposed facility could have a negative visual impact.

Commuters on the railway lines (especially passenger trains) also represent visual receptors, but are not considered to be sensitive to visual intrusion, especially in such close proximity to a built up area.

The severity of the visual impact on visual receptors decreases with increased distance from the proposed facility.



Map 4: Observer proximity, areas of high viewer incidence and potential sensitive visual receptors.

5.5. Visual impact index

The combined results of the visual exposure, viewer incidence / perception and visual distance of the proposed CPV Facility are displayed on **Map 5**.

Here the weighted impact and the likely areas of impact have been indicated as a visual impact index. Values have been assigned for each potential visual impact per data category and merged in order to calculate the visual impact index.

An area with short distance, a potential visual exposure to the proposed facility, a high viewer incidence and a predominantly negative perception would therefore have a higher value (greater impact) on the index. This helps in focussing the attention to the critical areas of potential impact when evaluating the issues related to the visual impact.

The following is of relevance:

- Areas of potentially **moderate** visual impact are indicated within a 4km radius of the proposed facility. The western section of this zone will be visually screened. The eastern railway line lies within the visually exposed zone and may also be exposed to potentially moderate visual impact.

  Within the 2km radius, sensitive visual receptors are limited to users of the secondary road running past the Newgate substation and a very short stretch of the R389 in the south. These receptors will experience a potentially **high** visual impact.

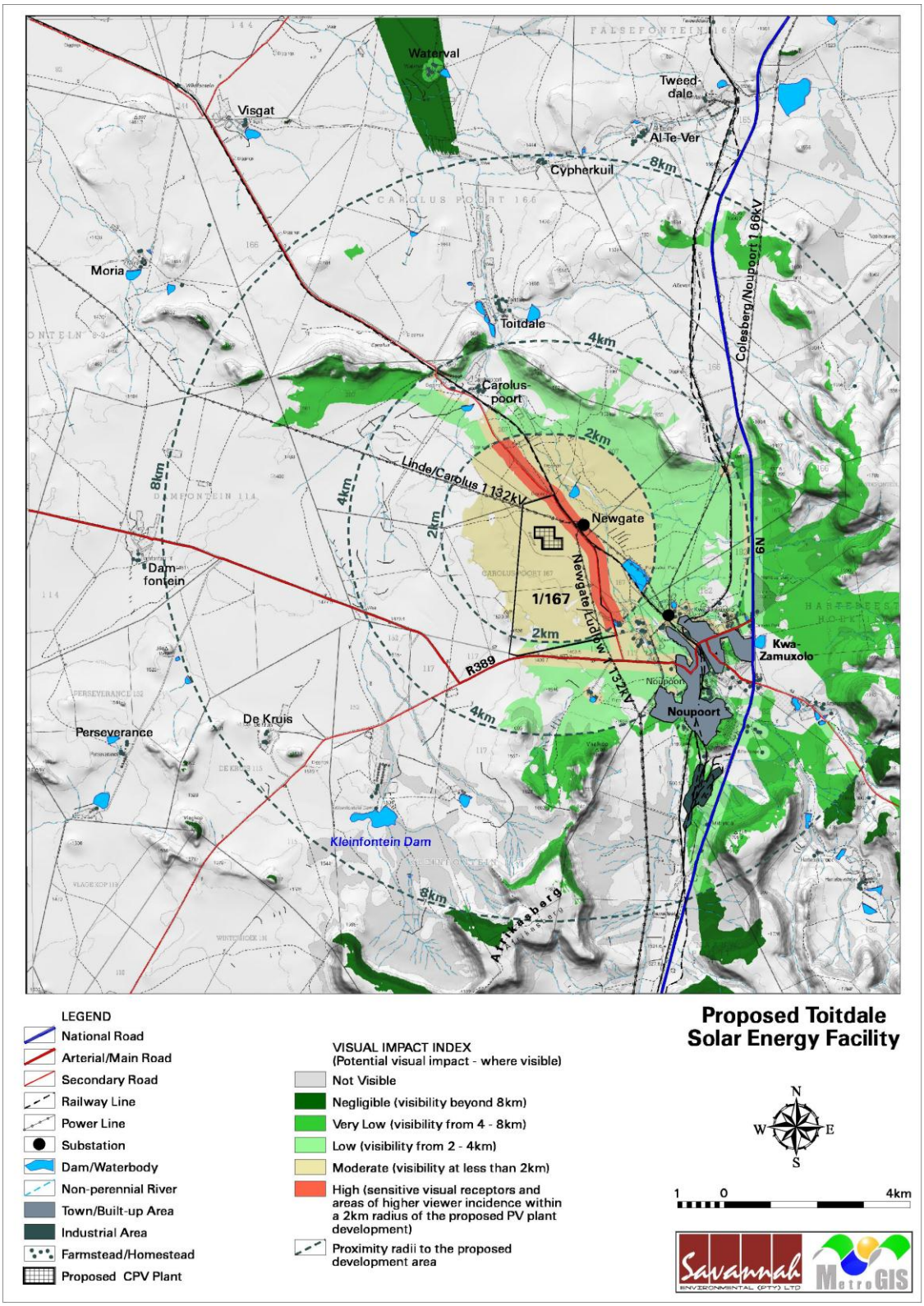
- The extent of potential visual impact remains limited between the 2km and 4km radius. Visually exposed areas are concentrated in the east, and to a lesser extent to the north and south. The north western parts of Noupoort and Kwa-Zamuxolo and sections of both railway lines lie within this zone. These areas are likely to be exposed to potentially **low** visual impact.

  Sensitive visual receptors include users of the above-mentioned secondary road, a short stretch of the R389 to the south as well as some homesteads and settlements north west of Noupoort. These receptors will experience a potentially **moderate** visual impact.

- Between the 4km and 8km radios, the extent of potential visual impact is reduced. Visually exposed areas lie mainly to the east, with smaller visually exposed patches in the north and south. The southern parts of Noupoort and the eastern parts of Kwa-Zamuxolo lie within the zone, and are likely to experience potentially **very low** visual impact.

  Stretches of the N9 in the east and of the R389 are likely to be exposed to potentially **low** visual impact. In addition, some isolated homesteads / settlements south east of Noupoort may be exposed to **low** visual impact.

- Beyond a radius of 8km from the site, the magnitude of visual impact is mostly **negligible** where impact occurs at all.



Map 5: Visual impact index of the proposed CPV Facility.

5.6. Visual impact assessment: methodology

The previous section of the report identified specific areas where likely visual impacts would occur. This section will attempt to quantify these potential visual impacts in their respective geographical locations and in terms of the identified issues (see Chapter 2: SCOPE OF WORK) related to the visual impact.

The methodology for the assessment of potential visual impacts states the **nature** of the potential visual impact (e.g. the visual impact on users of major roads in the vicinity of the proposed CPV facility) and includes a table quantifying the potential visual impact according to the following criteria:

- **Extent** - site only (very high = 5), local (high = 4), regional (medium = 3), national (low = 2) or international (very low = 1).
- **Duration** - very short (0-1 yrs = 1), short (2-5 yrs = 2), medium (5-15 yrs = 3), long (>15 yrs = 4), and permanent (= 5).
- **Magnitude** - None (= 0), minor (= 2), low (= 4), medium/moderate (= 6), high (= 8) and very high (= 10). This value is read off the Visual Impact Index Map. Where more than one value is applicable, then the higher of these will be used in order to simulate a worst case scenario.
- **Probability** – very improbable (= 1), improbable (= 2), probable (= 3), highly probable (= 4) and definite (= 5). This value is read from the visual impact index.
- **Status** (positive, negative or neutral).
- **Reversibility** - reversible (= 1), recoverable (= 3) and irreversible (= 5).
- **Significance** - low, medium or high.

The **significance** of the potential visual impact is equal to the **consequence** multiplied by the **probability** of the impact occurring, where the consequence is determined by the sum of the individual scores for magnitude, duration and extent (i.e. **significance = consequence (magnitude + duration + extent) x probability**).

The significance weighting for each potential visual impact (as calculated above) is as follows:

- <30 points: Low (where the impact would not have a direct influence on the decision to develop in the area)
- 31-60 points: Medium/moderate (where the impact could influence the decision to develop in the area)
- >60: High (where the impact must have an influence on the decision to develop in the area)

*Please note that due to the declining visual impact over distance, the **extent** (or spatial scale) rating is reversed (i.e. a localised visual impact has a higher value rating than a national or regional value rating). This implies that the visual impact is highly unlikely to have a national or international extent, but that the local or site-specific impact could be of high significance.*

5.7 Visual impact assessment: primary impacts

5.7.1 The CPV Facility

Potential visual impact on users of secondary roads in close proximity to the proposed CPV Facility.

Visual impacts on users of the secondary road running past the Newgate substation and a short section of the R389, within a radius of 2km of the proposed facility are expected to be of **high** significance, both before and after mitigation.

Table 2: Impact table summarising the significance of visual impacts on users of secondary roads in close proximity to the proposed CPV Facility.

Nature of Impact: Potential visual impact on users of secondary roads in close proximity to the proposed CPV Facility.		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	High **(8)**	Moderate **(6)**
Probability	Definite **(5)**	Probable **(3)**
Significance	Moderate **(80)**	Moderate **(42)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	No	
Mitigation: Planning: ➢ Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site. ➢ Retain and maintain natural vegetation in all areas outside of the development footprint. Operations: ➢ Maintain the general appearance of the facility as a whole. Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions.		
Cumulative impacts: The construction of the CPV Facility and ancillary infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is relevant in light of the existing power lines and the Newgate Substation already present in the area. In addition, the proposed Noupoort East CPV facility is located less than 1km east of the site, but has not yet been authorised (EIA).		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Potential visual impact on sensitive visual receptors within the region.

The visual impact users of main roads (i.e. the N9 and the R389), secondary roads and residents of homesteads and settlements within the region beyond the 2km radius, is expected to be of **moderate** significance, but may be mitigated to **low**.

Table 3: Impact table summarising the significance of visual impacts on sensitive visual receptors within the region.

Nature of Impact: Potential visual impact on sensitive visual receptors within the region		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Regional **(3)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	Probable **(3)**	V Improbable **(1)**
Significance	Moderate **(42)**	Low **(13)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: Planning: ➢ Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site. ➢ Retain and maintain natural vegetation in all areas outside of the development footprint. Operations: ➢ Maintain the general appearance of the facility as a whole. Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions.		
Cumulative impacts: The construction of the CPV Facility and ancillary infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is relevant in light of the existing power lines and the Newgate Substation already present in the area. In addition, the proposed Noupoort East CPV facility is located less than 1km east of the site, but has not yet been authorised (EIA).		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

Potential visual impact on residents of built up and urban areas within the region.

The visual impact on residents of Noupoort and Kwa-Zamuxolo is expected to be of **low** significance and may be mitigated to **very low.**

Table 4: Impact table summarising the significance of visual impacts on residents of built up and urban areas within the region.

Nature of Impact: Potential visual impact on residents of built up and urban areas within the region.		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	Regional **(3)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Low **(4)**	Low **(4)**
Probability	Improbable **(2)**	V Improbable **(1)**
Significance	Low **(22)**	Low **(11)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

Planning:

- Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site.
- Retain and maintain natural vegetation in all areas outside of the development footprint.

Operations:

- Maintain the general appearance of the facility as a whole.

Decommissioning:

- Remove infrastructure not required for the post-decommissioning use of the site.
- Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
- Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Cumulative impacts:

The construction of the CPV Facility and ancillary infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is relevant in light of the existing power lines and the Newgate Substation already present in the area. In addition, the proposed Noupoort East CPV facility is located less than 1km east of the site, but has not yet been authorised (EIA).

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Potential visual impact on commuters travelling by rail in close proximity to the proposed CPV Facility and within the region.

Commuters and tourists travelling by rail, especially those travelling by luxury coach, may be impacted upon within both in close proximity to the proposed CPV facility (i.e. within 2km), and within the region (up to a distance of about 7km from the proposed facility).

Visual impacts are expected to be of **moderate** significance but may be mitigated to a **low**.

Table 5: Impact table summarising the significance of visual impacts on commuters travelling by rail in close proximity to the proposed CPV Facility and within the region.

Nature of Impact: Potential visual impact on commuters travelling by rail in close proximity to the proposed CPV Facility and within the region.		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	Moderate **(42)**	Low **(28)**
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated	Yes	
Mitigation: Planning: ➢ Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site. ➢ Retain and maintain natural vegetation in all areas outside of the development footprint. Operations: ➢ Maintain the general appearance of the facility as a whole. Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions.		
Cumulative impacts: The construction of the CPV Facility and ancillary infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is relevant in light of the existing power lines and the Newgate Substation already present in the area. In addition, the proposed Noupoort East CPV facility is located less than 1km east of the site, but has not yet been authorised (EIA).		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

5.7.2 Ancillary infrastructure

Potential visual impact of ancillary infrastructure on observers in close proximity to the proposed CPV Facility.

The construction of the on-site switch-gear, the access roads, the workshops and the storage areas could present a visual impact as these structures are built forms within a natural context. In addition, vegetation will need to be removed for these structures to be built.

Although no dedicated viewshed has been generated for the above infrastructure, all this infrastructure will all be located within the proposed CPV Facility footprint. The visibility of this infrastructure will thus lie within the viewshed of the primary infrastructure. The anticipated visual impact resulting from this infrastructure is likely to be of **low** significance before mitigation and **very low** after mitigation.

Table 6: Impact table summarising the significance of visual impact of ancillary infrastructure on observers in close proximity to the proposed CPV Facility.

Nature of Impact: Potential visual impact of ancillary infrastructure on observers in close proximity to the proposed CPV Facility.		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	Improbable **(2)**	V Improbable **(1)**
Significance	Low **(28)**	Low **(14)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: Planning: ➢ Plan internal roads and ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. Consolidate infrastructure as much as possible, and make use of already disturbed areas rather than pristine sites wherever possible. ➢ Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site. ➢ Retain / maintain natural vegetation in all areas outside of the development footprint. Construction: ➢ Rehabilitation of all construction areas. ➢ Ensure that vegetation is not cleared unnecessarily to make way for the access road and ancillary buildings. Operation: ➢ Maintenance of roads to avoid erosion and suppress dust. Decommissioning: ➢ Removal of infrastructure and roads not required for post decommissioning use and rehabilitation of the footprint areas. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions.		
Cumulative impacts: The construction of ancillary infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is relevant in light of the existing power lines and the Newgate Substation already present in the area. In addition, the proposed Noupoort East CPV facility is located less than 1km east of the site, but has not yet been authorised (EIA).		
Residual impacts: The visual impact will be removed after decommissioning, provided the ancillary infrastructure is removed. Failing this, the visual impact will remain.		

5.7.4. Construction Impacts

Potential visual impact of construction on observers in close proximity to the proposed CPV Facility.

During the construction period, there will be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and land owners in the area. Dust from construction work could also result in potential visual impact.

This anticipated impact is likely to be of **moderate** significance, and may be mitigated to **low**.

Table 7: Impact table summarising the significance of visual impact of construction on visual receptors in close proximity to the proposed CPV Facility.

Nature of Impact: Potential visual impact of construction on visual receptors in close proximity to the proposed CPV Facility.		
	No mitigation	***Mitigation considered***
Extent	Local **(4)**	Local **(4)**
Duration	Very short term **(1)**	Very short term **(1)**
Magnitude	Moderate **(6)**	Moderate **(6)**
Probability	Probable **(3)**	Improbable **(2)**
Significance	Moderate **(33)**	Low **(22)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: <u>Construction:</u> ➢ Ensure that vegetation is not unnecessarily cleared or removed during the construction period. ➢ Reduce the construction period through careful logistical planning and productive implementation of resources. ➢ Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible. ➢ Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. ➢ Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. ➢ Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). ➢ Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting. ➢ Rehabilitate all disturbed areas, construction areas, roads, slopes etc immediately after the completion of construction works.		
Cumulative impacts: None.		
Residual impacts: None.		

5.8 Visual impact assessment: secondary impacts

5.8.1 The CPV Facility and ancillary infrastructure

Potential visual impact of the proposed facility on the visual character of the landscape and the sense of place of the region.

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria and specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc) play a significant role.

A visual impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

Specific aspects contributing to the sense of place of this region include the undeveloped, wide open spaces against the backdrop of low hills and mountains. Shrubland dominates the land use, and small agricultural homesteads and settlements are dotted throughout the study area at sparse intervals. Urban development is localised and contained. This renders the overall visual quality of the study area to be high.

The table overleaf illustrates the assessment of this anticipated impact, which is likely to be of **low** significance, both before and after mitigation.

Table 8: Impact table summarising the significance of visual impacts on the visual character of the landscape and sense of place of the region.

Nature of Impact: Potential visual impact of the proposed facility on visual character of the landscape and sense of place of the region		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	Regional **(3)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Low **(4)**	Low **(4)**
Probability	Improbable **(2)**	V Improbable **(1)**
Significance	Low **(22)**	Low **(11)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

Planning:

- Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site.
- Retain and maintain natural vegetation in all areas outside of the development footprint.

Operations:

- Maintain the general appearance of the facility as a whole.

Decommissioning:

- Remove infrastructure not required for the post-decommissioning use of the site.
- Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
- Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Cumulative impacts:

The construction of the CPV Facility and ancillary infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is relevant in light of the existing power lines and the Newgate Substation already present in the area. In addition, the proposed Noupoort East CPV facility is located less than 1km east of the site, but has not yet been authorised (EIA).

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.

Potential visual impact of the proposed facility on tourist access routes within the region.

The anticipated visual impact of the facility on the N9, which is a recognised national tourist access route, is expected to be of **low** significance, both before and after mitigation.

Table 9: Impact table summarising the significance of visual impacts on the tourist access routes within the region.

Nature of Impact: Potential visual impact of the proposed facility on tourist access routes within the region		
	No mitigation	***Mitigation considered***
Extent	Regional **(3)**	Regional **(3)**
Duration	Long term **(4)**	Long term **(4)**
Magnitude	Low **(4)**	Low **(4)**
Probability	Improbable **(2)**	V Improbable **(1)**
Significance	Low **(22)**	Low **(11)**
Status (positive or negative)	Negative	Negative
Reversibility	Recoverable **(3)**	Recoverable **(3)**
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: Planning: ➢ Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site. ➢ Retain and maintain natural vegetation in all areas outside of the development footprint. Operations: ➢ Maintain the general appearance of the facility as a whole. Decommissioning: ➢ Remove infrastructure not required for the post-decommissioning use of the site. ➢ Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. ➢ Monitor rehabilitated areas post-decommissioning and implement remedial actions.		
Cumulative impacts: The construction of the CPV Facility and ancillary infrastructure will increase the cumulative visual impact of electrical type infrastructure within the region. This is relevant in light of the existing power lines and the Newgate Substation already present in the area. In addition, the proposed Noupoort East CPV facility is located less than 1km east of the site, but has not yet been authorised (EIA).		
Residual impacts: The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed. Failing this, the visual impact will remain.		

5.9 The potential to mitigate visual impacts

The appearance and size of the CPV panels (with an approximate height of 15m) is not possible to mitigate. The functional design of the structures cannot be changed in order to reduce visual impacts.

Secondary impacts anticipated as a result of the proposed facility (i.e. visual character, sense of place, tourism value and tourism potential) are also not possible to mitigate.

The following mitigation is, however possible:

- Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site. This measure will give some distance between the facility footprint and the visual receptors.

- Retain / re-establish and maintain natural vegetation in all areas outside of the development footprint. This measure will help to soften the appearance of the facility within its context.

- In terms of ancillary infrastructure, it is recommended that the access road and ancillary infrastructure be planned in such a way and in such a location that clearing of vegetation is minimised. This implies consolidating infrastructure as much as possible and making use of already disturbed areas rather than pristine sites wherever possible.

- Mitigation of visual impacts associated with the construction phase, albeit temporary, entails proper planning, management and rehabilitation of the construction site and all disturbed areas. Recommended mitigation measures include the following:

    - Ensure that vegetation is not unnecessarily cleared or removed during the construction period.
    - Reduce the construction period through careful logistical planning and productive implementation of resources.
    - Plan the placement of lay-down areas and any potential temporary construction camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.
    - Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
    - Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
    - Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).
    - Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.
    - Rehabilitate all disturbed areas, construction areas, roads, slopes etc immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.

- During operation, the maintenance of the CPV panels and all ancillary structures and infrastructure will ensure that the facility does not degrade, thus aggravating visual impact.

- Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as a when required.

- Once the CPV Facility has exhausted its life span, the main facility and all associated infrastructure not required for the post rehabilitation use of the site should be removed and all disturbed areas appropriately rehabilitated. An ecologist should be consulted to give input into rehabilitation specifications.

- All rehabilitated areas should be monitored for at least a year following decommissioning, and remedial actions implemented as and when required.

Good practice requires that the mitigation of both primary and secondary visual impacts as listed above be implemented and maintained on an ongoing basis.

6. CONCLUSIONS AND RECOMMENDATIONS

The construction and operation of the proposed Toitdale solar Energy Facility and its associated infrastructure will have a visual impact on the visual environment especially within, but not limited to the area within 2km of the proposed facility.

The author is, however, of the opinion that the facility has an advantage over other more conventional power generating plants (e.g. coal-fired power stations). The facility utilises a renewable source of energy (considered as an international priority) to generate power and is therefore generally perceived in a more favourable light. It does not emit any harmful by-products or pollutants and is therefore not negatively associated with possible health risks to observers.

The facility further has a generally unfamiliar novel and futuristic design that invokes a curiosity factor not generally present with other conventional power generating plants. The advantage being that the facility can become an attraction or a landmark within the region, that people would actually want to come and see.

These positive aspects should not distract from the fact that the facility would be visible within an area that incorporates certain sensitive visual receptors. These include commuters and tourists making use of main and secondary roads and residents nearby homesteads and settlements.

Outside of the urban and industrial areas, the region has an undeveloped, rural character with a high visual quality.

However, it is noteworthy that the site lies relatively close to the urban areas of Noupoort and Kwa-Zamuxolo. The proposed development also lies in close proximity to power lines, railway lines and the Newgate Substation. In this respect, the terrain immediately surrounding the proposed facility has been visually impacted upon to some extent.

In light of the above, and considering all factors, it is concluded that the significance of anticipated visual impacts may be mitigated to acceptable levels. Therefore the anticipated visual impact of the proposed CPV facility is considered to be within acceptable limits.

7. IMPACT STATEMENT

The finding of the Visual Impact Assessment undertaken for the Proposed CPV Facility located close to Noupoort is that the visual environment surrounding the site will be visually impacted upon for the anticipated operational lifespan of the facility (i.e. 20 - 30 years).

The following is a summary of impacts remaining, assuming mitigation as recommended is exercised:

- The potential visual impact of the facility on users of the secondary road running between the past the Newgate substation, in close proximity to the proposed facility will be of **high** significance.

- The anticipated visual impact on sensitive visual receptors (i.e. users of main and secondary roads and residents of homesteads and settlements within the region will be of **low** significance.

- Within the region, the potential visual impact of the facility on residents of Noupoort and Kwa-Zamuxolo will be of **low** significance.

- The potential visual impact of the facility on tourists travelling by rail in close proximity to the proposed facility and within the region will be of **low** significance.

- In terms of ancillary infrastructure, the anticipated visual impact of on-site switch-gear, the access roads, the workshops and the storage areas is expected to be of **low** significance.

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- Lastly, the anticipated impact on the visual character of the landscape and the sense of place of the region, as well as on the N9 tourist access route will be of **low** significance.

The anticipated visual impacts listed above (i.e. post mitigation impacts) are primarily low, with only one remaining moderate. None of these anticipated impacts are considered to be fatal flaws from a visual perspective. The main considerations in this regard are the limited extent of visual exposure and the relatively low occurrence of potential visual receptors.

It is therefore recommended that the development of the facility as proposed be supported, subject to the implementation of the recommended mitigation measures (Chapter 5.9) and management plan (Chapter 8).

8. MANAGEMENT PROGRAMME

The management plan tables aim to summarise the key findings of the visual impact report and to suggest possible management actions in order to mitigate the potential visual impacts.

Table 11: Management Programme – Planning.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the planning of the proposed CPV Facility.		
Project Component/s	CPV Facility and ancillary infrastructure (i.e. internal access roads, substation, offices, workshop, and storage areas).	
Potential Impact	Primary visual impact of the facility due to the presence of the CPV panels and associated infrastructure as well as the visual impact of lighting at night.	
Activity/Risk Source	The viewing of the above mentioned by observers on or near the site (i.e. within 2 km of the site) as well as within the region.	
Mitigation: Target/Objective	Optimal planning of infrastructure to minimise visual impact.	
Mitigation: Action/control	**Responsibility**	**Timeframe**
Retain a buffer (approximately 100m wide) of intact natural vegetation along the perimeter of the development site. This buffer may be within or behind the security fence.	Toitdale Solar Energy / Design Consultant	Early in the planning phase.
Retain and maintain natural vegetation in all areas outside of the development footprint.	Toitdale Solar Energy/ Design Consultant	Early in the planning phase.
Plan the transformer, access roads and ancillary buildings in such a way and in such a location that clearing of vegetation is minimised. Consolidate infrastructure and make use of already disturbed sites rather than pristine areas.	Toitdale Solar Energy / Design Consultant	Early in the planning phase.
Performance Indicator	Minimal exposure of CPV panels, ancillary infrastructure and lighting at night to observers on or near the site (i.e. within 2km) and within the region.	
Monitoring	Not applicable.	

Table 12: Management Programme – Construction.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the construction of the proposed CPV Facility.		
Project Component/s	Construction site	
Potential Impact	Visual impact of general construction activities, and the potential scarring of the landscape due to vegetation clearing and resulting erosion.	
Activity/Risk Source	The viewing of the above mentioned by observers on or near the site (i.e. within 2 km of the site).	
Mitigation: Target/Objective	Minimal visual intrusion by construction activities and intact vegetation cover outside of immediate works areas.	
Mitigation: Action/control	**Responsibility**	**Timeframe**
Ensure that vegetation is not unnecessarily cleared or removed during the construction period.	Toitdale Solar Energy / Contractor	Early in the construction phase.
Reduce the construction period through careful logistical planning and productive implementation of resources.	Toitdale Solar Energy / Contractor	Early in the construction phase.
Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.	Toitdale Solar Energy / Contractor	Early in and throughout the construction phase.
Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.	Toitdale Solar Energy / Contractor	Throughout the construction phase.
Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.	Toitdale Solar Energy / Contractor	Throughout the construction phase.
Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).	Toitdale Solar Energy / Contractor	Throughout the construction phase.
Restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.	Toitdale Solar Energy / Contractor	Throughout the construction phase.
Rehabilitate all disturbed areas, construction areas, servitudes etc immediately after the completion of construction works. Consult an ecologist to give input into rehabilitation specifications.	Toitdale Solar Energy / Contractor	Throughout and at the end of the construction phase.
Performance Indicator	Vegetation cover on and in the vicinity of the site is intact (i.e. full cover as per natural vegetation within the environment) with no evidence of degradation or erosion.	
Monitoring	Monitoring of vegetation clearing during construction (by contractor as part of construction contract). Monitoring of rehabilitated areas quarterly for at least a year following the end of construction (by contractor as part of construction contract).	

Table 13: Management Programme – Operation.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the operation of the proposed CPV Facility.		
Project Component/s	CPV Facility and ancillary infrastructure (i.e. internal access roads, switch-gear, offices, workshop, and storage areas).	
Potential Impact	Visual impact of facility degradation and vegetation rehabilitation failure.	
Activity/Risk Source	The viewing of the above mentioned by observers on or near the site (i.e. within 2 km of the site).	
Mitigation: Target/Objective	Well maintained and neat facility.	
Mitigation: Action/control	**Responsibility**	**Timeframe**
Maintain the general appearance of the facility as a whole, including the turbines the internal roads, servitudes and the ancillary buildings.	Toitdale Solar Energy / Operator	Throughout the operational phase.
Maintain roads to forego erosion and to suppress dust.	Toitdale Solar Energy / Operator	Throughout the operational phase.
Monitor rehabilitated areas, and implement remedial action as and when required.	Toitdale Solar Energy / Operator	Throughout the operational phase.
Performance Indicator	Well maintained and neat facility with intact vegetation on and in the vicinity of the facility.	
Monitoring	Monitoring of the entire site on an ongoing basis (by operator).	

Table 14: Management Programme – Decommissioning.

OBJECTIVE: The mitigation and possible negation of visual impacts associated with the decommissioning of the proposed CPV Facility.		
Project Component/s	CPV Facility and ancillary infrastructure (i.e. internal access roads, switch-gear, offices, workshop, and storage areas).	
Potential Impact	Visual impact of residual visual scarring and vegetation rehabilitation failure.	
Activity/Risk Source	The viewing of the above mentioned by observers on or near the site (i.e. within 2 km of the site).	
Mitigation: Target/Objective	Only the infrastructure required for post decommissioning use of the site retained and rehabilitated vegetation in all disturbed areas.	
Mitigation: Action/control	**Responsibility**	**Timeframe**
Remove infrastructure not required for the post-decommissioning use of the site. This may include the offices, workshop, storage areas, access roads etc.	Toitdale Solar Energy / Operator	During the decommissioning phase.
Rehabilitate access roads not required for the post-decommissioning use of the site. Consult an ecologist to give input into rehabilitation specifications.	Toitdale Solar Energy / Operator	During the decommissioning phase.
Monitor rehabilitated areas quarterly for at least a year following decommissioning, and implement remedial action as and when required.	Toitdale Solar Energy / Operator	Post decommissioning.
Performance Indicator	Vegetation cover on and in the vicinity of the site is intact (i.e. full cover as per natural vegetation within the environment) with no evidence of degradation or erosion.	
Monitoring	Monitoring of rehabilitated areas quarterly for at least a year following decommissioning.	

9. REFERENCES/DATA SOURCES

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